

# Options Considered

## Radio part

We decide to set a radio into the remote. We will buy an easy radio and use its board and connect it to our remote.

Many small radios can be found online:



This kind of radio only has two buttons on it, reset and scan, it can scan channels automatically. We can use a PIC board to connect these two buttons to our remote.

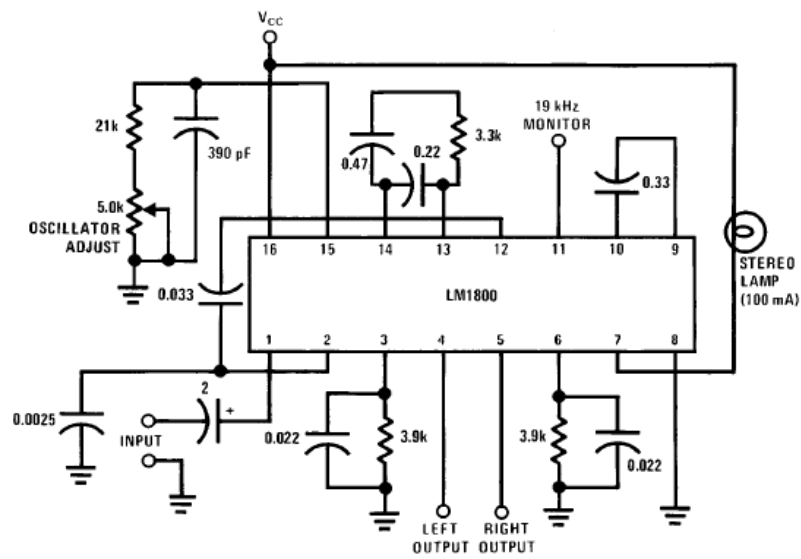
- 1) Two buttons can change the volume up and down.
- 2) Push the button longer to scan the channels.

Budget:

Radio: \$2

PIC: can use the board from ECE 376.

## Typical Application

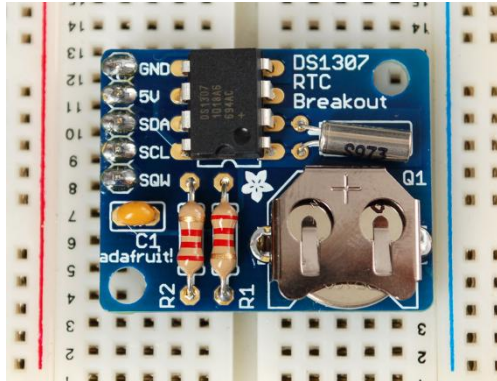


I prefer this one; we can build a radio with LM1800N and interface our device easier.

All the elements can be found from Jeff.

## TIMER

### 1.



DS1307

This is a great battery-backed real time clock (RTC) that allows your microcontroller project to keep track of time even if it is reprogrammed, or if the power is lost. Perfect for data logging, clock-building, time stamping, timers and alarms, etc. The DS1307 is the most popular **RTC**.

2. This is an originally designed module for the DS1307 Real Time Clock. It uses Lithium coin cell battery (CR2032). The DS2032 is accessed via the I2C protocol. Battery not included, but it is a commonly found watch battery. Free Pin-headers included. Solder them on board to make the RTC module directly sit on your Duinos.



DS2032

3.



### **Precision timers**

Precision monolithic timing circuits are capable of producing accurate time delays or oscillation. In the time-delay or monostable mode of operation, the timed interval is controlled by a single external resistor and capacitor network. In the astable mode of operation, the frequency and duty cycle may be independently controlled with two external resistors and a single external capacitor.

The threshold and trigger levels are normally two-thirds and one-third, respectively, of VCC. These levels can be altered by use of the control voltage terminal.

- Output circuit is capable of sinking or sourcing current up to 200mA
- Operation is specified for supplies of 5 to 15 V
- With a 5-V supply, output levels are compatible with TTL inputs

### **Our option:**

We will go with the DS 1307.

### Advantages:

- It has a back up battery.
- It is apt to be used for a timer.
- It is quite cheap. (\$9)

We can use this RTC with a PIC board and program for a Timer which will power on or off a device.

## Options for Audio Outputs

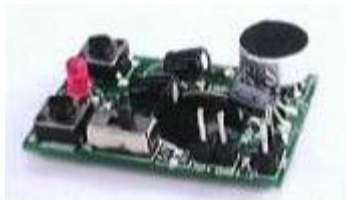
We want our remote to have audio outputs to make it more convenient for disabled people to use.

We will let the remote speak out what the current channel is. Also, we will let the remote to speak out some easy sentences controlled by the user.

Users can change channels by two buttons and one specific light will turn on if one channel is selected. After the light turns on, the corresponding voice will come out.

## Audio Recorder:

We will use an audio recorder chip to record the voices in the remote.



The A96020 voice recording module offers true single chip solid state storage capability and requires no software or micro-controller support. It provides high quality recording and playback with dual 20 second message. Sampling rate is 3.2K. Size: 34 x 23 x 11 mm. All you need to do is add a speaker (not included) and 5V DC Power (not included). Features - Non volatile flash memory technology - No battery back up required - User friendly, easy to operate - Slide switch for record or play back - Separate key to trigger message 1 or 2 - Low power consumption - LED to indicate recording and playback - Built-in condenser mic - Automatic power down - 5-6V Operation. 8.89\$

## Speaker inside the remote:

GF0661-ND

EAKER 8 OHM .3W 66MM ROUND

300Hz ~ 8kHz

<http://search.digikey.com/us/en/products/GF0661/GF0661-ND/304439>



5.13\$

### **Speaker outside the remote:**

We need a **headphone jack** on our remote.



Generic New 3.5mm Female to 2.5mm Male Headphone Earphone Adapter Converts Your 3.5mm Earphone Jack Into 2.5mm Earphone Jack D . 2\$

Then we can have a speaker connected to it or use a Bluetooth earphone as the audio output.

### **Pillow Speaker:**



Great for auditory scanners, this lightweight pillow speaker provides a discreet and comfortable alternative to headphones. Included cloth cover is machine washable. Uses standard 2.5mm headphone jack. 21.95\$

### **Bluetooth headphone:**



Bluetooth Breakout - Bluegiga WT-32. Connect this circuit to the remote so that we can use a Bluetooth headphone. 89.95\$. I got the information from vish.



14-Day Return Sound ID 300 Bluetooth Headset. 14.99\$.

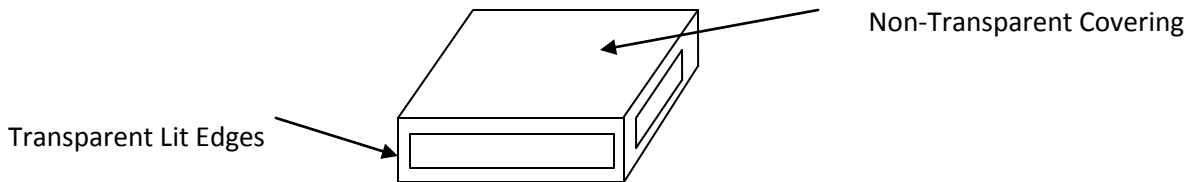
For now, I am considering using both speakers inside and outside the remote. The speaker inside the remote will only come out the simple sentences the user wants to speak. And I prefer the Bluetooth headphone as the outside audio output. Those outputs include the radio outputs and tell the user what the current channel is.

The total budget for it may be around 128\$. (I can borrow the bluegiga board and headphone from vish.)

## *LEDs and External Enclosure Options*

### **Transparent Material with LEDs underneath**

#### **Lit Edges with Non-transparent Covering Everywhere Else**



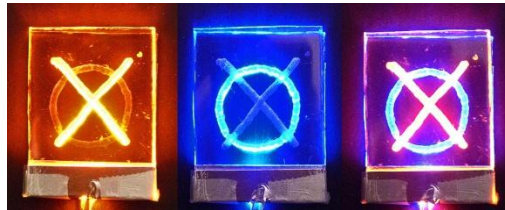
#### Advantages:

- Have the LEDs rotate between various colors to give an illumination show around the edges of the enclosure (soothing to the user)
- Makes our product more unique
- Have switch to be able to turn LEDs on or off

#### Disadvantages:

- Increase the complexity of the product
- Could make unit more breakable if not properly designed
- Extra add-on that might not be wanted by user

#### **Name of Remote Lit Up on Transparent Material**



#### Advantages:

- Have the LEDs alternate between various colors to give an illumination show around the edges of the enclosure (soothing to the user)
- Makes our product more unique
- Have switch to be able to turn LEDs on or off
- With our product name displayed, we would be promoting our product

#### Disadvantages:

- Increase the complexity of the product
- Could make unit more breakable if not properly designed
- Extra add-on that might not be wanted by user

### **Non-transparent plastic**

#### Advantages:



- Easiest to make
- Potentially more durable
- Cheaper
- Potentially weighs less

Disadvantages:

- Less attractive with respect to the transparent material and LEDs
- More like other product's enclosures that already exist

## **LEDs on exterior**

Advantages:

- Use LED to signify whether the device is in stand-by mode or in active mode
- Use LEDs to signify which category the user cycling through the available options (example TV LED is lit up when cycling through various TV options)
- Adds more visual stimulus compared to just a plain cover

Disadvantages:

- Could be unused if the user cannot look down at them
- Some users could find the LEDs unpleasing or annoying
- Increases power consumptions

## **Parts List**

3/8"x12"x12" acrylic sheet	\$8.88 +\$7.71 S&H
Non-transparent plastic	~\$10.00+S&H
LEDs	\$0.50x50+S&H
External Switch	\$0.50+S&H

## ==Project Overview==

"Aerial vehicle for the observation of Franklin's gulls' nests"

Franklin's Gulls are migratory aquatic nesters. Their migratory patterns can be used to study changes in climate. Because they nest in marshes, census data on the gulls can be difficult to collect. Individual nests can be very difficult to visit on foot or by boat. As such, an aerial vehicle would greatly ease the process of collecting census data. Minimum altitudes likewise make aerial surveys using a human-piloted aircraft difficult. This project involves the design and construction of an aerial vehicle(balloon, plane, or other) equipped with a camera to allow accurate survey of the Franklin's gull population/nests.

[[File:Gulls.jpg|thumb|Franklin's Gulls' Nesting Area]]

## ==Members==

\*Lucas Brendel

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## ==Advisor==

Dr. Green

## ==Clients==

Dr. Mark Clark and Dr. Wendy Reed from the Biological Sciences Department of NDSU

==Documents==

[[Media:File.Aerial\_Bird\_Observation\_Vehicle\_Requirements\_Capture.docx|Requirements  
Capture]]